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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/913,696	08/16/2001	Sascha Marcus Spangenberg	668-63	2990
7590	07/27/2005			
Lewis F Gould Jr Duane Morris & Heckscher One Liberty Place Philadelphia, PA 19103			EXAMINER WARE, CICELY Q	
			ART UNIT 2634	PAPER NUMBER

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

a

## Office Action Summary

Application No.

09/913,696

Applicant(s)

SPANGENBERG ET AL.

Examiner

Cicely Ware

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date: _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Response to Arguments*

1. Applicant's arguments, see Remarks, filed 3/14/2005 with respect to the rejection(s) of claim(s) 1-5, 8, 9, 11 under 35 USC 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Lim et al. (US Patent 6,240,099) and Raghunath (US Patent 6,314,441).

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5, 8, 9, 11 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lim et al. (US Patent 6,240,099) in view of Raghunath (US Patent 6,314,441).

(1) With regard to claim 1, Lim et al. discloses in (Fig. 1, Fig. 2B, Fig. 3) a direct sequence code division multiple access receiver comprising an adaptive filter controlled by an adaptive algorithm for filtering data which has been multiplied by a spreading code and filtered by a channel filter, the adaptive filter having a length appropriate to model the inverse of the channel filter, a multiuser detector operating on the output of

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the adaptive filter (abstract, col. 1, lines 4-10, 54-62, col. 5, lines 30-33, 42-44, 47-53, 65-67, col. 1, line 1, 7-9, 55-61, col. 7, lines 57-62, col. 8, lines 16-20, 38-39, col. 9, lines 17-20).

However Lim et al. does not disclose the adaptive filter having a length appropriate to model the inverse of the channel filter.

However Raghunath discloses wherein the adaptive filter having a length appropriate to model the inverse of the channel filter (col. 2, lines 1-9, col. 3, lines 28-44).

Therefore it would have been obvious to one of ordinary skill in the art to modify Lim et al. to incorporate the adaptive filter having a length appropriate to model the inverse of the channel filter in order to reduce the complexity of the adaptive filter by designing it to not rely on the use of an adder/subtractor for each coefficient (Raghunath, col. 2, lines 54-57).

(2) With regard to claim 2, claim 2 inherits all the limitations of claim 1. Lim et al. further discloses in (Fig. 2B) the algorithm is trained using the signal of a desired user (col. 6, lines 29-61).

(3) With regard to claim 3, claim 3 inherits all the limitations of claim 1. Lim et al. further discloses in Fig. 1 wherein the algorithm is trained using a composite signal from more than one user (col. 3, lines 64-66, col. 7, lines 5-19, 57-62).

(4) With regard to claim 4, claim 4 inherits all the limitations of claim 1. Lim et al. further discloses wherein the multiuser detector is of the minimum mean squared error type (col. 2, lines 19-21, col. 7, lines 51-55).

(5) With regard to claim 5, claim 5 inherits all the limitations of claim 1. Lim et al. further discloses wherein the multiuser detector is of the zero forcing (decorrelating) type in order to invert the channel matrix in order to recover the transmitted signal vector (col. 1, lines 59-65, col. 2, lines 10-18).

(6) With regard to claim 8, claim 8 inherits all the limitations of claim 1. Lim et al. further discloses wherein the multiuser detector is of the cancellation type in order to subtract the estimated interference components (col. 2, lines 55-61).

(7) With regard to claim 9, claim 9 inherits all the limitations of claim 1. Lim et al. further discloses wherein the multiuser detector is of the near optimum decoding type in order to demodulate the bits transmitted by each user (col. 1, lines 24-31).

(8) With regard to claim 11, claim 11 inherits all the limitations of claim 1. Lim et al. further discloses wherein the algorithm comprises the recursive least squares algorithm (col. 6, lines 55-57).

(9), With regard to claim 16, claim 16 inherits all the limitations of claim 1. Lim et al. further discloses wherein the adaptive filter is trained by new information at a chip rate at which chip rate the spreading code is input (col. 6, lines 55-61, col. 8, lines 32-48, col. 10, lines 1-19).

4. Claims 6, 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lim et al. (US Patent 6,240,099) in view of Raghunath (US Patent 6,314,441), as applied to claim 1, and further in view of Tanner et al. (previously cited).

(1) With regard to claim 6, claim 6 inherits all the limitations of claim 1.

Lim et al. in combination with Raghunath disclose all the limitations of claim 1 above. However Lim et al. in combination with Raghunath do not disclose wherein the multiuser detector is of the Volterra type.

However Tanner et al. discloses wherein the multiuser detector is of the Volterra type (abstract, Pg. 1167, col. 6-53).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Lim et al. in combination with Raghunath to incorporate wherein the multiuser detector is of the Volterra type because multiuser interference is nonlinear and for the best performance of the optimum receiver, which is a nonlinear filter (Tanner et al., Pg. 1169, col. 2, lines 11-16)

(2) With regard to claim 7, claim 7 inherits all the limitations of claim 1. Tanner et al. further discloses wherein the multiuser detector is of the Radial Basis Function type because it has a neural-network structure, which allows the calculation of optimum centres and weights (abstract, Pg. 1167, col. 6-53).

(3) With regard to claim 10, claim 10 inherits all the limitations of claim 1. Tanner et al. further discloses wherein the algorithm comprises the least squares algorithm to estimate the filter coefficients without calculating the autocorrelation matrix explicitly (Pg. 1169, col. 1, lines 34-36).

5. Claims 12 -15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lim et al. (US Patent 6,240,099) in view of Raghunath (US Patent 6,314,441), as applied to claim 1 above, and further in view of Carayannis et al. (previously cited).

(1) With regard to claim 12, claim 12 inherits all the limitations of claim 1.

Lim et al. in combination with Raghunath disclose all the limitations of claim 1 above. However Lim et al. in combination with Raghunath do not disclose wherein the algorithm comprises the fast a-posteriori or sequential technique algorithm.

However Carayannis et al. disclose wherein the algorithm comprises the fast a-posteriori or sequential technique algorithm (abstract, Pg. 1394, col. 2, lines 21-31).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Lim et al. in combination with Raghunath to incorporate wherein the algorithm comprises the fast a-posteriori or sequential technique algorithm in order to take better advantage of the relationships between forward and backward linear prediction (Carayannis et al., abstract).

(2) With regard to claim 13, claim 13 inherits all the limitations of claim 1.

Carayannis et al. further discloses wherein the algorithm comprises the stabilized fast a-posteriori error sequential technique algorithm (abstract, Pg. 1394, col. 2, lines 21-31).

(3) With regard to claim 14, claim 14 inherits all the limitations of claim 12. Lim et al. further discloses wherein said algorithm is used in combination with the Fast Newton algorithm in order to minimize the receiver structure to permit a further degree of freedom in modeling the signal (col. 6, lines 55-59).

(4) With regard to claim 15, see rejection of claims 13 and 14.

***Conclusion***


6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 571-272-3047. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

***Cicely Ware***

cqw  
July 15, 2005



STEPHEN CHIN  
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